

# Projectile problem 2

A ball is hit at a  $35^\circ$  angle upward and leaves the bat at 80 m/s. Find

sol 8

- a) the initial horizontal speed

$$V_{x_i} = 66 \text{ m/s}$$

$$V_i = 80 \text{ m/s}$$

$$V_{x_i} = 80 \sin 35^\circ = 45.5 \text{ m/s}$$

- b) the initial vertical speed

$$V_{y_i} = 46 \text{ m/s}$$

- c) the time it takes to hit the ground

$$V_{Fy} = V_{iy} + a_y t$$

$$0 = 46 + -9.8 t \quad \therefore t = \left( \frac{-46}{-9.8} \right) = 4.7 \text{ s}$$

- d) the height it will travel

$$d_y = V_{iy} t + \frac{1}{2} a t^2 = (46) (4.7) + \frac{1}{2} (-9.8) (4.7)^2$$

$$216 \text{ m} - 108 \text{ m} = 108 \text{ m}$$

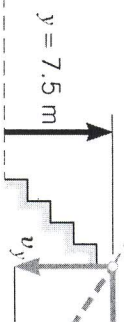
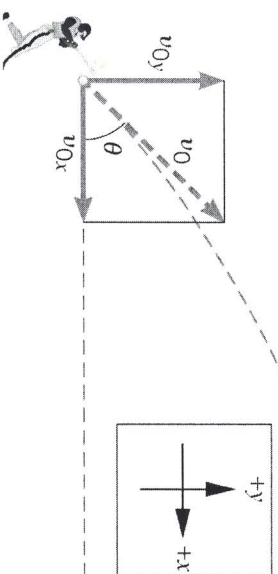
- d) the horizontal distance it will travel

$$V_x = \frac{dx}{dt}$$

$$46 \text{ m/s} = \frac{dx}{dt}$$

$$dx = 46 \text{ m/s} \cdot dt$$

$$v = 36 \text{ m/s}$$



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$$620 \text{ m}$$